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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,814	11/20/2003	Jeremy Buc Slay	2003-IP-012730 U1 USA	9717
32376	7590	03/20/2006	EXAMINER	
LAWRENCE R. YOUST DANAMRAJ & YOUST, P.C. 5910 NORTH CENTRAL EXPRESSWAY SUITE 1450 DALLAS, TX 75206			POULOS, SANDRA K	
		ART UNIT	PAPER NUMBER	
		1714		
DATE MAILED: 03/20/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/717,814	BUC SLAY ET AL.	
	Examiner Sandra K. Poulos	Art Unit 1714	

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 02 January 2006.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) 12-38 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-11 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 20 November 2003 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____ .  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/12/04;7/18/05</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____ .                                  |

## DETAILED ACTION

### ***Information Disclosure Statement***

1. The country code for the Japanese references cited by applicant have been changed from "JA" to the correct "JP".

The reference "Peroxide Vulcanized Perfluoroelastomers" by Sanvito has not been considered because it is not in English and no translation has been provided.

### ***Specification***

2. The disclosure is objected to because of the following informalities:

In the description of Figure 10 on page 24 please define NS. Examiner suggests amending the second sentence in paragraph 49 to "...such as the depicted nanostructure 220 (NS)".

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

3. Claims 4 and 6 are objected to because of the following informalities: Please replace the acronyms in claim 4 with the intended elastomers. In claim 6, "comprising" should be "comprises".

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 is indefinite because it is not known what is meant by "scale" and whether it is referring to diameter, radius, length, thickness, etc. Plate-like clays such as montmorillonite disclosed in paragraph 57 can have a very different length compared to thickness and therefore it is necessary to clarify what is meant by "scale". For the purposes of examination, examiner has assumed that "scale" is the same as "diameter" in spherical particles and "length" in plate-like particles and fibers, i.e. "scale" indicates the longest dimension.

***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Omum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422

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F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-11 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-35 of U.S. Patent No. 7,013,998.

Although the conflicting claims are not identical, they are not patentably distinct from each other because of the explanation below.

The claims of US 7,013,998 disclose a drill bit with a seal element comprising a nanocomposite material including a polymer host material and a plurality of nanostructures selected from the group consisting of polysilane resins, polycarbosilane resins, polysilsesquioxane resins, and polyhedral oligomeric silsesquioxane resins. The seal element is selected from o-rings, etc. The polymer host material further comprises an elastomer such as nitrile butadiene, etc. The nanoparticles have a scale of 0.1 to 500 nm. The nanostructures further comprise material such as metal oxides or silicon. The nanostructures have interfacial interactions such as copolymerization, etc.

The difference between the claims of US 7,013,998 and the current claims is that the current claims refer to "a seal element for providing a seal between two components in a downhole tool" whereas the claims of US 7,013,998 refer to "a seal element positioned between the drill bit body and the rotary cutter". However, since the drill bit

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body and rotary cutter are specific components in a downhole tool, the current claims are obvious in view of the claims in US 7,013,998.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-4, 6-8, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Kirk et al (US 5,524,718) in view of the evidence disclosed by Ciullo (Industrial Minerals and Their Uses) and Zinc Corporation of America (ZCA).

Kirk discloses a seal assembly disposed between the cylindrical journal bearing surface and the cutter proximally to the base of the cantilevered bearing shaft (abstract). The seal assembly includes at least one resilient sealing ring, an O-ring in particular, which is formed of a carboxylated hydrogenated acrylonitrile butadiene rubber (XHNBR). The seal is effective for journal bearing rock bits under the conditions encountered in down-hole drilling (col 2, lines 20-50). O-ring compositions with either XHNBR or HNBR mixed with N550 carbon black and zinc oxide are disclosed (col 6). According to Ciullo, N500 carbon blacks have an average size of 40 to 48 nm (pg 223).

ZCA discloses that Kadox 911 (the zinc oxide used in Kirk) is a powder and reinforcing agent in rubber and has a mean particle size of 120 nm. In the production of the preferred O-ring compound made with the XHNBR polymer, the carboxylation contained in the XHNBR polymer is reacted with zinc oxide or other divalent metal oxide to form a very strong ionic bond (col 6, lines 37-40).

Therefore, Kirk anticipates the cited claims.

7. Claims 1, 3, 4, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Uyehara (US 4,851,068) in view of the evidence disclosed by Ciullo (Industrial Minerals and Their Uses).

Uyehara discloses a sealing element that is can be used in downhole operations (col 1, lines 12-18, 47-55, 67-68; col 1, lines 1-52). Fluoroelastomer rubbers or highly saturated rubbers (HSU) can be used (col 5, lines 45-53). The composition includes N330 carbon black (col 5, lines 55-68). According to Ciullo, N300 carbon blacks have an average size of 26 to 30 nm (pg 223). Zinc oxide activator, sulfur vulcanizing (cross-linking) agent, and very finely powdered silver are also present (col 5, line 55 to col 6, line 5).

Therefore, Uyehara anticipates the cited claims.

8. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Martinez et al (US 5,459,202) in view of the evidence disclosed by Ciullo (Industrial Minerals and Their Uses).

Martinez discloses fluoroelastomer seals, such as gaskets and O-rings (col 1, lines 5-56). Martinez does not disclose that the seal is a seal for a downhole tool, however, it is to be noted that a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

The O-ring formulation contains TPE (tetrafluoroethylene), EPDM (ethylene propylene diene) and N900 carbon black, which according to Ciullo has an average size of 201 to 500 nm (pg 223).

Therefore, Martinez anticipates the cited claims.

9. Claims 1-4 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Upton et al (US Re 36,452) in view of the evidence disclosed by Ciullo (Industrial Minerals and Their Uses).

Upton discloses an elastomeric O-ring for a sealed bearing rotary cone rock bit (col 2, lines 10-64). The seal is confined within a seal cavity formed between a rotary cutter cone and a bearing journal (col 2, lines 31-33). The seal formulations are given in the Tables in columns 4-6. HSN polymer, N990 carbon black, which according to Ciullo has an average size of 201 to 500 nm (pg 223), zinc oxide, and Kevlar fiber.

Therefore, Upton anticipates the cited claims.

10. Claims 1-3, 5, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Ellsworth (US 5,962,553).

Ellsworth discloses a nanocomposite comprising a polymer and layered clay (col 2, lines 16-55). Composites of the invention can be used in such applications as seal, gaskets, and O-rings (col 3, lines 4-8). Although Ellsworth does not specifically disclose that the seal is a seal for a downhole tool, it is to be noted that a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

The layered clay is described from column 3, line 20 to column 4, line 33. The polymer is described in column 4, line 34 to column 8. A preferred fluoroplastic is ethylene-tetrafluoroethylene copolymer, which is used in the examples. PEEK is also used in the examples.

Therefore, Ellsworth anticipates the cited claims.

11. Claims 1, 3-5, and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Arrigoni et al (Oilfield Engineering with Polymers Conference) in view of the evidence disclosed by Ciullo (Industrial Minerals and Their Uses).

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Arrigoni discloses seal composition for use in oil drilling (introduction). Although Arrigoni does not specifically disclose that the seal is a seal for a downhole tool, it is to be noted that a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

The composition is a nano-PTFE filled fluoroelastomer that can be obtained by finely dispersing a semi-crystalline perfluoropolymer in the FKM matrix (process description, pg 251). The particle size is usually 40-50 nm. The FKM/PTFE nanocomposites can be extra-filled with either carbon black or white fillers (conclusions, pg 256). Zinc oxide and N326 carbon black are present in the formulation in Tables 1 and 2 (pg 253-254). According to Ciullo, N300 carbon blacks have an average size of 26 to 30 nm (pg 223 of Industrial Minerals and Their Uses).

Therefore, Arrigoni anticipates the cited claims.

12. Claims 1, 3, 4, 6-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Obrecht et al (US 2002/0161119).

Obrecht discloses a rubber composition that are suitable for such applications as seals (abstract, para 51). Although Obrecht does not specifically disclose that the seal is a seal for a downhole tool, it is to be noted that a preamble is generally not accorded

any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Rubber component (A) includes such rubbers as XNBR, XSBR and those listed paragraph 10. Rubber component (B) has a particle diameter of preferably 10 to 600 nm and are disclosed in paragraphs 16-17. Suitable fillers include carbon blacks (para 31-32), 5-400 nm precipitated silicas (para 33), 5-400 nm synthetic silicates (para 34), natural silicates such as kaolin (para 35), metal oxides (para 36), and fibers (para 40-41). In the Examples, Table 2 discloses a mixture of natural rubber, carbon black N330, silica, Si 69, zinc oxide, and other ingredients (para 58).

Therefore, Obrecht anticipates the cited claims.

13. Claims 1-3 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohata et al (US 5,134,170).

Ohata discloses an acrylic rubber composition including reinforcing filler and powder of a diameter of 200 to 10,000 nm (col 1, lines 48-59; col 3 line 50 to col 4 line 65). At the lower range diameters, the powder is considered a nanomaterial. The powder is preferably poly(methyl silsesquioxane) (col 4, lines 32-54). The reinforcing filler can be carbon black or silicas (col 3, lines 50-64). The rubber composition can be satisfactory as a material for the manufacture of various kinds of parts including o-rings

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(col 5, lines 61-66). Although Ohata does not specifically disclose that the seal is a seal for a downhole tool, it is to be noted that a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). The material may also be used as a sponge gasket (col 6, lines 49-53).

Therefore, Ohata anticipates the cited claims.

### ***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Estes (US 3,879,044) discloses a fluoroelastomer o-ring containing fibers which serve as a filler and magnesium oxide.

Badesha et al (US 5,668,203) discloses a fluoroelastomer o-ring/gasket containing metal oxide and polyorganosiloxane.

Denton (US 5,323,863) discloses an o-ring seal for rock bit bearings containing HSN, furnace black, magnesium or zinc oxide.

Shen et al (US 4,761,447) discloses a seal comprising an organopolysiloxane resin and precipitated silica with a particle size of less than 80 nm.

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Asaumi et al (US 4,839,221) discloses a gasket containing polytetrafluoroethylene resin and a fine inorganic power.

Gilman et al (US 2003/0050354) discloses a polyurethane resin useful as a gasket or seal; the composition includes a layered nanoclay.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sandra K. Poulos whose telephone number is (571) 272-6428. The examiner can normally be reached on M-F 7:30-4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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